

IN THE CLAIMS:

1. (Currently amended) A radiation detector for homeland security comprising:

a substantially rigid opaque tube [structure];

a scintillating fiber mounted and supported within [to] the substantially rigid opaque tube [structure], the scintillating fiber having a first end and a second end; the scintillating fiber having a length of between about 8 inches and about 10 feet;

a light intensity measuring device mounted to the substantially rigid opaque tube [structure] in a substantially relatively immovable manner;

coupling means for optically coupling the first end of the scintillating fiber to an active portion of the light intensity measuring device;

means for shielding the scintillating fiber from ambient light;

wherein the light intensity measuring device produces an output signal in accordance with an amount of light generated by the scintillating fiber;

[wherein the substantially rigid structure comprises a substantially rigid opaque tube, the scintillating fiber being disposed inside the opaque tube with a longitudinal axis of the scintillating fiber extending in a direction away from the active portion of the light intensity measuring device, and] wherein the light intensity measuring device comprises a battery-powered

photomultiplier tube attached to a first end of the substantially rigid opaque tube by a light-proof connection, wherein the coupling means comprises an adapter plate attached to the battery-powered photomultiplier tube and fitted within the first end of the substantially rigid opaque tube, wherein a light-proof cover is provided at a second end of the substantially rigid opaque tube, and wherein the scintillating fiber is enclosed entirely within the substantially rigid opaque tube between the battery-powered photomultiplier tube and the light-proof cover.

2. (Original) The radiation detector as recited in claim 1, wherein the output signal from the light intensity measuring device is fed through an integrator circuit, which filters high frequency variations that may be included in the output signal of the light intensity measuring device, to an analog-to-digital converter for subsequent input to a digital signal processor.

3. (Original) The radiation detector as recited in claim 2, wherein a response time of the integrator circuit is between about 3 ms and about 1 second.

4. (Original) A system comprising the radiation detector as recited in claim 1, wherein the radiation detector is mounted to a support structure adjacent to an object travel path in such a manner that the longitudinal axis of the scintillating fiber extends transversely to a direction of movement of objects along

the travel path.

5. (Original) A system comprising the radiation detector as recited in claim 1, wherein the radiation detector is mounted to a roadway between leading and trailing ramps in such a manner that the longitudinal axis of the scintillating fiber extends transversely to a direction of movement of vehicles on the roadway.

6. (Original) The system as recited in claim 5, wherein a length of the scintillating fiber is approximately equal to a width of the roadway.

7. (Original) A system comprising the radiation detector as recited in claim 1, wherein the radiation detector is mounted to a moving vehicle for providing spatial radiation mapping of a large area.

8. (Original) The radiation detector as recited in claim 1, wherein the output signal from the light intensity measuring device is fed through a circuit which filters high frequency variations that may be included in the output signal of the light intensity measuring device.

9. (Original) The radiation detector as recited in claim 8, wherein the circuit comprises an RC low-pass filter circuit.

10. (Original) The radiation detector as recited in claim 9, wherein an RC time constant of the circuit is between about 0.001 sec and 0.4 seconds for minimizing any effects of solar radiation spikes.

11. (Original) The radiation detector as recited in claim 8, wherein the integrator circuit provides a system response time of between about 3 ms and about 1 second.

12. (Original) The radiation detector as recited in claim 1, wherein the output signal from the light intensity measuring device is fed through an integrator circuit, which filters high frequency variations that may be included in the output signal of the light intensity measuring device, to a voltage-to-frequency converter and then to a sound generating device for producing an audible frequency with a pitch proportional to absorbed radiation dose-rate.

13. (Original) A radiation detector for homeland security comprising:

a substantially rigid tube;

a scintillating fiber mounted to the substantially rigid tube, the scintillating fiber having a first end and a second end; the scintillating fiber having a length of between about 8 inches and about 10 feet;

a light intensity measuring device mounted to the

substantially rigid tube in a substantially relatively immovable manner;

coupling means for optically coupling the first end of the scintillating fiber to an active portion of the light intensity measuring device;

means for shielding the scintillating fiber from ambient light;

wherein the light intensity measuring device produces an output signal in accordance with an amount of light generated by the scintillating fiber;

wherein a cross-sectional dimension of the scintillating fiber is approximately 5 mm and a longitudinal axis of the scintillating fiber extends in a direction away from the active portion of the light intensity measuring device; and

wherein the output signal from the light intensity measuring device is fed through an integrator circuit, which filters high frequency variations that may be included in the output signal of the light intensity measuring device, and to an analog-to-digital converter for subsequent input to a digital signal processor.

14. (Original) The radiation detector as recited in claim 13, wherein the substantially rigid tube comprises a substantially rigid opaque tube, and wherein the scintillating fiber is disposed inside the opaque tube.

15. (Original) The radiation detector as recited in claim 14,

wherein the opaque tube comprises a thin-walled aluminum tube.

16. (Original) The radiation detector as recited in claim 14, wherein the opaque tube has a rectangular cross-section.

17. (Original) The radiation detector as recited in claim 14, further comprising a substantially rigid support tube disposed and supported within the opaque tube, wherein the scintillating fiber is disposed within the support tube.

18. (Original) The radiation detector as recited in claim 14, wherein the light intensity measuring device comprises a photomultiplier tube attached to a first end of the substantially rigid opaque tube by a light-proof connection.

19. (Original) The radiation detector as recited in claim 18, wherein the scintillating fiber is at least about 3 feet long.

20. (Original) The radiation detector as recited in claim 13, wherein the integrator circuit provides a system response time of between about 3 ms and about 1 second.

21. (Original) The radiation detector as recited in claim 13, wherein the integrator circuit provides a system response time of about 0.08 seconds.

22. (Original) The radiation detector as recited in claim 13, wherein the integrator circuit provides a system response time of about 0.8 seconds.

23. (Original) The radiation detector as recited in claim 13, wherein the integrator circuit comprises an RC circuit having an RC time constant of between about 0.001 seconds and about 0.4 seconds for minimizing any effects of solar radiation spikes.

24. (Original) A radiation detector for homeland security comprising:

- a substantially rigid structure;

- a scintillating fiber mounted to the substantially rigid structure, the scintillating fiber having a first end and a second end; the scintillating fiber having a length of between about 8 inches and about 10 feet;

- a light intensity measuring device mounted to the substantially rigid structure in a substantially relatively immovable manner;

- coupling means for optically coupling the first end of the scintillating fiber to an active portion of the light intensity measuring device;

- means for shielding the scintillating fiber from ambient light;

- wherein the light intensity measuring device produces an output signal in accordance with an amount of light generated by

the scintillating fiber;

wherein the substantially rigid structure comprises a substantially rigid opaque tube, and wherein the scintillating fiber is disposed inside the opaque tube, with a longitudinal axis of the scintillating fiber extending in a direction away from the active portion of the light intensity measuring device; and

wherein the output signal from the light intensity measuring device is fed through a low-pass filter which filters high frequency variations that may be included in the output signal of the light intensity measuring device, and to an analog-to-digital converter for subsequent input to a digital signal processor.

25. (Original) The radiation detector as recited in claim 24, wherein the opaque tube comprises a thin-walled aluminum tube.

26. (Original) The radiation detector as recited in claim 24, wherein the opaque tube has a rectangular cross-section.

27. (Original) The radiation detector as recited in claim 24, wherein the light intensity measuring device comprises a photomultiplier tube attached to a first end of the opaque tube by a light-proof connection.

28. (Original) The radiation detector as recited in claim 27, wherein the scintillating fiber is at least about 6 feet long.

29. (Original) The radiation detector as recited in claim 24, further comprising a substantially rigid support tube disposed and supported within the opaque tube, wherein the scintillating fiber is disposed within the support tube.

30. (Original) A radiation detector for homeland security comprising:

- a substantially rigid structure;

- a scintillating fiber mounted within the substantially rigid structure, the scintillating fiber having a first end and a second end, a length greater than 8 inches and less than about 10 feet, and a cross-sectional dimension of at least 2.5 mm;

- a light intensity measuring device mounted to the substantially rigid structure in a substantially relatively immovable manner;

- coupling means for optically coupling the first end of the scintillating fiber to an active portion of the light intensity measuring device;

- means for shielding the scintillating fiber from ambient light;

- wherein the light intensity measuring device produces an output signal in accordance with an amount of light generated by the scintillating fiber; and

- wherein the output signal from the light intensity measuring device is fed through a low-pass filter which filters high frequency variations that may be included in the output signal of

the light intensity measuring device, and to an analog-to-digital converter for subsequent input to a digital signal processor.

Claims 31 - 34 (cancelled)

35. (Original) The radiation detector as recited in claim 30, wherein a response time of the low-pass filter is between about 3 ms and about 1 second.

Claims 36 - 40 (cancelled)

41. (New) The radiation detector for homeland security as recited in claim 1, wherein the scintillating fiber extends substantially an entire length between the active portion of the light-intensity measuring device and the light-proof cover.

42. (New) The radiation detector for homeland security as recited in claim 13, wherein the light intensity measuring device is attached to a first end of the substantially rigid tube, a light-proof cover is provided at a second end of the substantially rigid tube, and wherein the scintillating fiber is enclosed entirely within the substantially rigid tube between the light intensity measuring device and the light-proof cover.

43. (New) The radiation detector for homeland security as recited in claim 42, wherein the scintillating fiber extends substantially

an entire length between the active portion of the light-intensity measuring device and the light-proof cover.

44. (New) The radiation detector for homeland security as recited in claim 18, wherein the photomultiplier tube comprises a battery-powered photomultiplier tube.

45. (New) The radiation detector for homeland security as recited in claim 24, wherein the light intensity measuring device is attached to a first end of the substantially rigid opaque tube, a light-proof cover is provided at a second end of the substantially rigid opaque tube, and wherein the scintillating fiber is enclosed entirely within the substantially rigid opaque tube between the light intensity measuring device and the light-proof cover.

46. (New) The radiation detector for homeland security as recited in claim 45, wherein the scintillating fiber extends substantially an entire length between the active portion of the light-intensity measuring device and the light-proof cover.

47. (New) The radiation detector for homeland security as recited in claim 24, wherein the light intensity measuring device is a battery-powered photomultiplier tube, wherein the coupling means comprises an adapter plate attached to the battery-powered photomultiplier tube and fitted within the first end of the substantially rigid opaque tube.

48. (New) The radiation detector for homeland security as recited in claim 30, wherein the light intensity measuring device comprises a battery-powered photomultiplier tube.